Amendment entered 11/30/04 RAL

Atty Dkt A213 1010.1

IN THE CLAIMS

The following will replace all prior versions, and listings, of the claims in this application:

Approved for entry RAL 11/29/04

1. (Canceled)

2. (Canceled)

3. (Currently Amended) ~~The optical monitoring system of claim 1,~~ An optical monitoring system for monitoring thin film deposition on a substrate, said system comprising:

a support configured to be attached on an inside of a deposition chamber;

a first fiber optic collimator supported by said support;

a first fiber for incoming light coupled to said first fiber optic collimator; and

a second fiber for outgoing light optically coupled to said first fiber optic collimator;

wherein said first fiber optic collimator comprises a two-fiber ferule that is coupled to said first fiber and said second fiber, wherein said second fiber transmits reflected light.

4. (Currently Amended) ~~The optical monitoring system of claim 1, further comprising:~~ An optical monitoring system for monitoring thin film deposition on a substrate, said system comprising:

a support configured to be attached on an inside of a deposition chamber;

a first fiber optic collimator supported by said support;

a first fiber for incoming light coupled to said first fiber optic collimator;

a second fiber for outgoing light optically coupled to said first fiber optic collimator; and

a second fiber optic collimator coupled to said second fiber,

wherein said second fiber transmits transmitted light.

5. (Currently Amended) ~~The optical monitoring system of claim 1, further comprising:~~ An optical monitoring system for monitoring thin film deposition on a substrate, said system comprising:

a support configured to be attached on an inside of a deposition chamber;

a first fiber optic collimator supported by said support;

a first fiber for incoming light coupled to said first fiber optic collimator;

a second fiber for outgoing light optically coupled to said first fiber optic collimator; and

a second fiber optic collimator coupled to said second fiber,

wherein said second fiber transmits reflected light.

6. (Currently Amended) ~~The optical monitoring system of claim 1,~~ An optical monitoring system for monitoring thin film deposition on a substrate, said system comprising:

a support configured to be attached on an inside of a deposition chamber;

a first fiber optic collimator supported by said support;

a first fiber for incoming light coupled to said first fiber optic collimator; and

a second fiber for outgoing light optically coupled to said first fiber optic collimator;

wherein said first fiber optic collimator comprises a GRIN lens.

7. (Previously Presented) The optical monitoring system of claim 6, wherein said first fiber optic collimator comprises a tap optical filter and an alignment glass rod.

8. (Currently Amended) ~~The optical monitoring system of claim 1,~~ An optical monitoring system for monitoring thin film deposition on a substrate, said system comprising:

a support configured to be attached on an inside of a deposition chamber;

a first fiber optic collimator supported by said support;

a first fiber for incoming light coupled to said first fiber optic collimator; and

a second fiber for outgoing light optically coupled to said first fiber optic collimator;

wherein the substrate comprises a monitored area that is monitored by collimated light from said first fiber optic collimator.

9. (Currently Amended) ~~The optical monitoring system of claim 1, further comprising:~~ An optical monitoring system for monitoring thin film deposition on a substrate, said system comprising:

a support configured to be attached on an inside of a deposition chamber;

a first fiber optic collimator supported by said support;

a first fiber for incoming light coupled to said first fiber optic collimator;

a second fiber for outgoing light optically coupled to said first fiber optic collimator; and

a strobe signal generator.

10. (Currently Amended) ~~The optical monitoring system of claim 2, further comprising:~~ An optical monitoring system for monitoring thin film deposition on a substrate, said system comprising:

a support configured to be attached on an inside of a deposition chamber;

a first fiber optic collimator supported by said support;

a first fiber for incoming light coupled to said first fiber optic collimator;

a second fiber for outgoing light optically coupled to said first fiber optic collimator;

a substrate holder configured to hold the substrate; a first shutter that prevents incoming deposition material from contacting at least a first portion of the substrate; and

a second shutter that prevents incoming deposition material from contacting at least a second portion of the substrate.

11. (Currently Amended) ~~The optical monitoring system of claim 2,~~ An optical monitoring system for monitoring thin film deposition on a substrate, said system comprising:

a support configured to be attached on an inside of a deposition chamber;

a first fiber optic collimator supported by said support;

a first fiber for incoming light coupled to said first fiber optic collimator;

a second fiber for outgoing light optically coupled to said first fiber optic collimator;

a substrate holder configured to hold the substrate; and

a first shutter that prevents incoming deposition material from contacting at least a first portion of the substrate;

wherein said first shutter is closed when a predetermined optical thickness on the substrate is reached.

12. (Previously Considered) The optical monitoring system of claim 11, wherein a determination is made that a predetermined optical thickness on the substrate is reached using an iterative process that includes a calculation of a predicted optical thickness.

13. (Currently Amended) ~~The optical monitoring system of claim 1,~~ An optical monitoring system for monitoring thin film deposition on a substrate, said system comprising:

a support configured to be attached on an inside of a deposition chamber;

a first fiber optic collimator supported by said support;

a first fiber for incoming light coupled to said first fiber optic collimator; and

a second fiber for outgoing light optically coupled to said first fiber optic collimator;

wherein said first fiber and said second fiber are comprised of a single fiber, and further comprising a beam splitter coupled to said single fiber.

14. (Previously Presented) A thin film substrate deposition device comprising:

a deposition chamber;

a support coupled to said deposition chamber;

a first fiber optic collimator coupled to said support;

a first fiber for incoming light coupled to said first collimator;

a second fiber for outgoing light optically coupled to said first fiber optic collimator;

a substrate holder coupled to said deposition chamber; and

a first shutter coupled to said deposition chamber and movable from an open position to a closed position that prevents incoming deposition material from contacting at least a first portion of the substrate.

15. (Original) The thin film substrate deposition device of claim 14, wherein said first fiber optic collimator comprises a two-fiber ferule that is coupled to said first fiber and said second fiber, wherein said second fiber transmits reflected light.

16. (Previously Presented) The thin film substrate deposition device of claim 14, further comprising:

a second fiber optic collimator coupled to said support, wherein said second fiber transmits transmitted light.

17. (Previously Presented) The thin film substrate deposition device of claim 14, further comprising:

a second fiber optic collimator coupled to said support, wherein said second fiber transmits reflected light.

18. (Original) The thin film substrate deposition device of claim 14, wherein said first fiber optic collimator comprises a GRIN lens.

19. (Original) The thin film substrate deposition device of claim 18, wherein said first fiber optic collimator comprises a tap optical filter and an alignment glass rod.

20. (Original) The thin film substrate deposition device of claim 14, wherein the substrate comprises a monitored area that is monitored by collimated light from said first fiber optic collimator.

21. (Previously Presented) The thin film substrate deposition device of claim 14, further comprising:

a strobe signal generator.

22. (Original) The thin film substrate deposition device of claim 14, further comprising:

a second shutter that prevents incoming deposition material from contacting at least a second portion of the substrate.

23. (Previously Presented) The thin film substrate deposition device of claim 14, wherein said first shutter is closed when a predetermined optical thickness on the substrate is reached.

24. (Previously Presented) The thin film substrate deposition device of claim 23, wherein a determination is made that a predetermined optical thickness on the substrate is reached using an iterative process that includes a calculation of a predicted optical thickness

25. (Original) The thin film substrate deposition device of claim 14, wherein said first fiber and said second fiber are comprised of a single fiber, and further comprising a beam splitter coupled to said single fiber.

26-32. (Canceled)

33. (Previously Presented) A deposition chamber having an optical monitoring system therein suitable for monitoring thin film deposition on a substrate, said optical monitoring system comprising:

a first fiber for incoming light coupled to a first fiber optic collimator;

a second fiber for outgoing light optically coupled to said first fiber optic collimator; and

a first shutter movable between:

an open position in which said first shutter permits incoming deposition material to contact at least a first portion of a substrate, and

a closed position in which said first shutter prevents incoming deposition material from contacting said at least a first portion of a substrate.

34. (Previously Presented) The deposition chamber according to claim 33, further comprising:

a second shutter configured, when in the closed position, to prevent incoming deposition material from contacting at least a second portion of a substrate.

35. (Previously Presented) The deposition chamber according to claim 34, wherein the first and second portions belong to separate substrates.

36. (Previously Presented) The deposition chamber according to claim 34, wherein the first and second shutters are autonomously controlled.

37. (Previously Presented) The deposition chamber according to claim 36, wherein the first and second shutters are connected to a substrate holder within the deposition chamber.

38. (Previously Presented) The deposition chamber according to claim 37, wherein the first and second shutters are rotated between the open and closed positions by a driver fixed on the substrate holder.

39. (Previously Presented) The deposition chamber according to claim 33, wherein said first fiber optic collimator comprises a two-fiber ferule, an alignment glass rod, a tap optical filter and a GRIN lens.

40. (Previously Presented) The deposition chamber according to claim 39, wherein said two-fiber ferule is coupled to said first and second fibers, and wherein said second fiber transmits reflected light.

41. (Previously Presented) The deposition chamber according to claim 33, further comprising:

a second fiber optic collimator coupled to said second fiber.

42. (Previously Presented) The deposition chamber according to claim 41, wherein each of said first and second fiber optic collimators comprises a single-fiber ferule and a GRIN lens.

43. (Previously Presented) The deposition chamber according to claim 41, wherein said second fiber transmits reflected light.

44. (Previously Presented) The deposition chamber according to claim 41, wherein said second fiber transmits transmitted light.

45. (Previously Presented) The deposition chamber according to claim 33, wherein said first fiber and said second fiber are comprised of a single fiber, and further comprising a beam splitter coupled to said single fiber.

46. (Previously Presented) The deposition chamber according to claim 33, wherein said first fiber optic collimator comprises a GRIN lens.

47. (Previously Presented) The deposition chamber according to claim 33, wherein said first fiber optic collimator comprises a tap optical filter and an alignment glass rod.

48. (Previously Presented) The deposition chamber according to claim 33, further comprising:
a strobe signal generator.

49. (Previously Presented) The deposition chamber according to claim 33, wherein said first shutter is closed when a predetermined optical thickness on the substrate is reached.

50. (Previously Presented) The deposition chamber according to claim 33, wherein a determination is made that a predetermined optical thickness on the substrate is reached using an iterative process that includes a calculation of a predicted optical thickness.

51. (Previously Presented) The deposition chamber according to claim 33, further comprising a substrate holder configured to rotate the substrate.

52. (Previously Presented) The deposition chamber according to claim 51, wherein the substrate undergoes rotation around more than one axis.

53. (Previously Presented) The deposition chamber according to claim 52, wherein the substrate undergoes planetary rotation.

54. (Previously Presented) The deposition chamber according to claim 33, wherein the substrate is monitored from its back side.

55. (Previously Presented) The deposition chamber according to claim 33, wherein the first fiber optic collimator is attached to the substrate.

56. (Previously Presented) The deposition chamber according to claim 55, wherein the first fiber optic collimator is attached to the substrate by glue.

57. (Previously Presented) The deposition chamber according to claim 33, wherein the substrate is provided with a strobe mark on a backside thereof for optical monitoring.

58. (Previously Presented) The thin film substrate deposition device of claim 14, further comprising a substrate holder configured to rotate the substrate.

59. (Previously Presented) The thin film substrate deposition device of claim 58, wherein the substrate is rotated around more than one axis.

60. (Previously Presented) The thin film substrate deposition device of claim 59, wherein the substrate undergoes planetary rotation.

61. (Previously Presented) The thin film substrate deposition device of claim 14, wherein the substrate is monitored from its back side.

62. (Previously Presented) The thin film substrate deposition device of claim 14, wherein the first fiber optics collimator is attached to the substrate.

63. (Previously Presented) The thin film substrate deposition device of claim 62, wherein the first fiber optics collimator is attached to the substrate by glue.

64. (Previously Presented) The deposition chamber according to claim 14, wherein the substrate is provided with a strobe mark on a backside thereof for optical monitoring.

65. (Previously Presented) The optical monitoring system of claim 13, wherein the first fiber is configured to both transmit and reflect light.

66. (Previously Presented) The optical monitoring system of claim 13, wherein the beam splitter is configured to separate a reflected signal from an incoming signal.

67. (Previously Presented) The optical monitoring system of claim 13, wherein the beam splitter is an optical circulator.

68. (Canceled)

69. (Canceled)